



Arizona Game and Fish Department

State of Arizona Aquatic Invasive Species Program

Vision for 2016-2025





The History of AIS Management in Arizona

The introduction of non-indigenous, aquatic invasives into the lower Colorado River and the inland waters of Arizona pose serious biological, environmental, and economic threats in Arizona. Aquatic invasive species (AIS) are invasive plants (e.g., giant salvinia; hydrilla) and animals (e.g., quagga mussel; Asian carp; red claw crayfish) that are transported and released, intentionally or unintentionally, outside of their native or historical range. Because they have few natural controls in new habitats, AIS spread rapidly and often alter the newly invaded aquatic system permanently. Once established, many invasive species prove exceptionally difficult to manage or eradicate.

The main pathways for introduction of AIS into Arizona include various human introductory means, such as state interconnected waterways (e.g., Colorado river reservoirs), inter and intrastate movement of watercraft, and the discard of live aquatic wildlife and plants (e.g., pets, food fish, decorative aquatic plants) into local waters, just to name a few. AIS can completely alter aquatic ecosystems and threaten the integrity of water resources and infrastructure. Consequences of AIS presence in Arizona include the destruction of native plant and animal habitat, damaged recreational sites and opportunities, lowered property values, clogged waterways, negative impacts on irrigation and power generation, and decreased overall biodiversity. Current state activities and authorities address some AIS issues and control measures. Therefore, it is essential that state, federal, and local agencies coordinate activities and begin to comprehensively manage the full range of AIS impacts.

In 2007, the Arizona Invasive Species Advisory Council (AISAC) was created per Executive Order 2007-07 by Governor Janet Napolitano. Co-chaired by the Director of the Arizona Game and Fish Department, AISAC completed its "Arizona Invasive Species Management Plan" and was approved by the Governor's Office in August, 2008. The completion of this management plan led to the establishment of a new program in the Arizona Game and Fish Department (Department) focused on invasive species management.



QUAGGA MUSSELS

In 2009, the Department continued its leading role in developing the state's response to invasive species with the development of Arizona's "Aquatic Invasive Species Interdiction Act" (HB 2157) that provided the Department's Director with certain program powers (17-255.01), such that:

The director may establish and maintain an aquatic invasive species program

The director may issue orders:

1. Establishing a list of AIS
2. Establishing a list of waters where AIS are present
3. Establishing mandatory conditions on the movement of watercraft from those listed waters.

AIS are officially defined in A.R.S §17-255 as:

"Any aquatic species that is not native to the ecosystem under consideration and whose introduction or presence in this state may cause economic or environmental harm or harm to human health. It does not include: (a) any non-indigenous species lawfully or historically introduced into this state for sport fishing recreation or; (b) any species introduced into this state by the Department, by other governmental entities or any person pursuant to this title."

In 2011, a more specific aquatic invasives plan (from the Department AIS Program and coordinated with AISAC) identified areas and general activities within the state for which technical and financial assistance was and is needed to eliminate or reduce the environmental, public health and safety risks associated with all aquatic nuisance species. This "state of Arizona AIS Management Plan-2011" has become the mechanism used by the Department to obtain federal funding allocated for AIS and has been periodically revised and adjusted based upon the practical experience gained from implementation, scientific research, public experience, and new tools as they have become available. This vision provides updated perspective and focus to the 2011 state plan.



2016-2026 Vision and Strategic Objectives for the Aquatic Invasive Species Program

The Department has developed, funded, and implemented an AIS Program (from A.R.S. §17-255) over the past six (6) years. Although numerous management efforts have been undertaken over the years, public compliance with AIS laws and rules (e.g., pull the plug) has remained lower than expected and the state is still at risk for AIS being spread to new waters throughout Arizona. Through the experience of operating this program, the Department recognizes the importance of Arizona's aquatic resources to its citizens, and proper stewardship requires a more comprehensive, collaborative, and coordinated state-wide response to the threat posed by these aquatic invaders. Therefore, the Department has developed this new comprehensive visionary approach for the AIS program guiding management for the next ten (10) years.

Vision: To halt the spread and eliminate, where possible, aquatic invasive species from becoming further established in Arizona waters.

Designed to protect Arizona from the long list of losses associated with the impacts of AIS, this vision is intended to direct program enhancements to provide further guidance into the future delivering a positive return on our investment. This ten (10) year vision focuses on providing a more comprehensive AIS management approach aimed at reducing the threat of AIS introductions and facilitates better coordination among our partners and the public.

Implementation of the vision will be driven through six strategic objectives.

- Objective 1:** Position the Department in the lead role for all AIS prevention and management activities in Arizona.
- Objective 2:** Contain the spread and eliminate, where possible, listed AIS already affecting Arizona waters.
- Objective 3:** Prevent the introduction of any new AIS into Arizona.
- Objective 4:** Increase Department, partner, and public compliance with AIS laws, rules, and best management practices.
- Objective 5:** Measure the success of the AIS Program and this Vision.
- Objective 6:** Develop a strong business approach to AIS management ensuring long term financial viability to implement the objectives in this Vision.

OBJECTIVE 1 LEADERSHIP

Position the Department in the lead role for all AIS prevention and management activities in Arizona.

The importance of comprehensive and coordinated partnership engagement by all governmental entities (local, state, federal) cannot be understated. The Department should play a leadership role in addressing and maintaining any and all AIS Program functions in the state and the West.

One of the first strategies in achieving this objective is to re-establish AISAC (co-Chaired by the Department and Arizona Department of Agricultural) through an Executive Order from the Governor. This would bring these state, federal, tribal, and local agencies back to the aquatic invasive species table to discuss future management of all invasive species, particularly aquatics. AISAC should function as a communication forum for all stakeholders for information sharing and guidance on terrestrial and aquatic invasive species issues. This will set the stage for a more coordinated effort, through the leadership of the Department, in pursuing and refining future AIS laws and rules.

In addition, the Department must continue in a leadership role with entities such as the Western Regional Panel of the Aquatic Nuisance Species Task Force, the Western Association of Fish and Wildlife Agencies, and the Western Governors Association as it pertains to AIS in North America. No single jurisdiction or state can accomplish AIS abatement on its own. Cross-jurisdictional, coordinated AIS management training must be a high priority as it pertains to the expectations of the boating public about boat inspections, watercraft decontaminations, and enforcement activities concerning their overall recreational experience and opportunities.

AIS LEADERSHIP APPROACHES:

- A. Re-establish the Arizona Invasive Species Advisory Council through Governor's Office Executive Order.
 - Pursue the need for increased and further engagement from other state and federal agencies and local stakeholders pertaining to statewide/regional aquatic invasive species management, prevention, and containment.
- B. Participate, support, and pursue leadership roles in regional, federal, and international efforts concerning AIS management and control. Examples include:
 - Western Regional Panel - Aquatic Nuisance Species Task Force (WRP-ANSTF)

- Western Association of Fish and Wildlife Agencies (WAFWA)
 - Colorado River Fish and Wildlife Council (CRFWC)
 - Western Invasive Species Coordinating Effort (WISCE)
 - Aquatic Nuisance Species Task Force (ANSTF)
 - Western Governors Association (WGA)
 - National Invasive Species Awareness Week (NISAW); Washington, D.C.
 - Invasive Species House Caucus; Hill Visits in Washington, D.C.
- C. Coordinate local area meetings (bi-annual or quarterly basis) with federal, state, and local stakeholders that focus on constructive discussion of issues and cooperative development of AIS implementation projects to address local AIS abatement issues.
- Central Arizona Quagga Team Meeting
 - Lk Mead Interagency AIS Team
 - Lk Powell Quagga Containment Team
 - Lk Havasu AIS Coordination Team
- D. Actively pursue coordination and resources from local agencies that have LE responsibilities at AIS affected waters (e.g., U.S. Forest Service; County Sheriff's office; National Park Service) pertaining to Arizona AIS laws and rules (A.R.S. §17-2655 and R12-4-1101 & 1102).
- E. Every few years, plan and provide for an AIS Summit in Arizona to update current status and potential prevention/management alternatives for our partners, to include state/federal/local entities and the various water-user groups and industry affected by AIS. This should include bordering state's representation as AIS abatement is a multi-jurisdictional issue.

Water and wildlife resources on AIS infested waters are managed by multiple federal, state, tribal, and local authorities. The primary coordinating agencies and a brief description of their existing authorities and programs are listed below:

Federal Agencies

No single federal agency has clear authority over all aspects of AIS management, but many agencies have programs and responsibilities that address aspects of the problem, such as importation, interstate transport, exclusion, control, and eradication. Federal activities on AIS management are generally coordinated through the Aquatic Nuisance Species Task Force (ANSTF), using the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990, and the National Invasive Species Act (NISA) of 1996.

U.S. FISH AND WILDLIFE SERVICE (USFWS) {Primary Federal Coordinating Agency} - The U.S. Fish and Wildlife Service's Aquatic Invasive Species Program is housed within the Fisheries and Habitat Conservation Programs Division of Fisheries and Aquatic Resource Conservation. The Branch of Aquatic Invasive Species essentially houses three functions: USFWS AIS Program; Administration of ANS Task Force; and Injurious Wildlife evaluations and listings {Lacey Act}.

U.S. FOREST SERVICE (USFS) - The U.S. Forest Service uses multiple authorities to manage aquatic and terrestrial invasive species (including vertebrates, invertebrates, plants, and pathogens), derived from laws enacted by Congress that authorize the Secretary of Agriculture to administer the agency (particularly the 193 million-acre National Forest System) and other resources and to issue necessary regulations. Many of these authorities have subsequently been delegated from the Secretary to the Chief of the U.S. Forest Service. Forest Service invasive species activities are guided by the agency's National Strategy and Implementation Plan for Invasive Species Management (2004) and other associated policies and program plans. The U.S. Forest Service provides technical and financial support to states and local organizations to address complex invasive species problems and establishment of cooperative partnerships against aquatic and terrestrial invasive species. The U.S. Forest Service participates on local, regional, and national invasive species coalitions and committees; including the Aquatic Nuisance Species Task Force and various ANS Regional Panels.

(continued on page 9)

OBJECTIVE

2

CONTAINMENT

Contain the spread and eliminate, where possible, listed AIS already affecting Arizona waters.

Containment of AIS infested waters is a challenge that must be met head-on. To achieve a goal of 100% containment of AIS in Arizona, we must eliminate movement of all AIS from infested waters to uninfested waters. Currently, the monetary cost for maintenance to our boating and angling public and our water conveyance infrastructure is very high for waters infested with AIS (estimates in excess of \$5 million annually). Further establishment of AIS in new waters would continue to exacerbate this issue and would likely lead to reductions in boaters and anglers due to the increased maintenance costs, further restrictions on recreation, and increasing water/electric rates due to widely vacillating maintenance expenses by Arizona's water and electric companies.

The Department's AIS Program has put forth a substantial amount of effort (over \$2 million) in invasive mussel abatement over the past five (5) years. The current Director's Orders have had limited success of containment as compliance is relatively low (e.g., in 2015, 67% of surveyed boaters regularly pull their boats plug). The process of waiting until a waterbody is confirmed as infested always places our management efforts as reactive versus proactive. Continuing with the same approach will lead to further AIS infested waters in Arizona. The Department will continually update our approach to this problem as a statewide, multi-jurisdictional issue and focus Department resources on listed AIS containment and prevention efforts and manpower in conjunction with federal, state and local partners.

The Department will continue to pursue changes to our laws, rules, and protocols that strengthen our statewide ability to halt any new introductions or the possibility of transporting existing AIS. These changes will address the highest risk pathways and should come in the form of targeting all watercraft (and water-based equipment) movement in Arizona.

Furthermore, expansion of watercraft inspection and decontamination capabilities and capacities (e.g., boots-on-the-ground) are necessary throughout Arizona and must include marinas, boat repair shops, boat ramps, and our own Departmental facilities. Where feasible, the Department will develop eradication procedures for small water systems in Arizona, such as local golf course ponds or our own Community Fishing Program waters. This will allow us to evaluate control/eradication research on a small scale and possibly reduce maintenance costs for those local user groups.



QUAGGA MUSSELS

CONTAINMENT APPROACHES:

- A. Pursue Director's Order changes; Rule change – Article 11 – R12-4-1102. Implement rule changes to AIS Director's Orders to require all watercraft owners/transporters statewide to clean, drain, and dry their watercraft and equipment before transport from all waters. Changes should require the following from all watercraft owners/transporters:
- Make reasonable efforts to drain all water (e.g., remove any and all barriers to drainage, such as plugs) prior to leaving any body of water in or bordering Arizona.
 - Keep all removable drainage plugs out of watercraft during transit to ensure that proper drying/desiccation/ventilation can occur.
 - All marina based and/or moored boats (e.g. long-term) must be decontaminated when leaving (e.g., transport away from lake; watercraft sales; etc.) any body of water in or bordering Arizona. Decontamination must follow Uniform Minimum Protocols & Standards for Watercraft Inspection-Decontamination as set forth by the Department's AIS Program.
- B. Develop and implement cooperative partnership agreements with land management agencies requiring Marina operators, through the permitting process, to implement current AIS Director's Orders.
- Locations should include marinas and other local waterbody businesses of interest.
 - Establish agreements with entities to provide properly trained personnel to operate and maintain decontamination equipment.
 - Establishment of professionally-trained and marina/lake management staffed watercraft inspection/decontamination facilities at all waters.
 - The Department will assist with equipment support, inspection/decontamination protocols, and training procedures.

(continued from page 7)

U.S. NATIONAL PARK SERVICE (NPS) - The National Park Service manages two National Recreation Areas (NRAs) in Arizona: Lake Mead NRA and Glen Canyon NRA. These contain large reservoirs and both Lake Mead and Lake Powell now have an established population of quagga mussels. These two Recreation Areas implement quagga and zebra mussel containment programs with combined annual budgets of over \$1.5 million dollars. The NPS also manages Grand Canyon National Park and 19 smaller units within the state of Arizona, several with aquatic resources that are vulnerable to AIS.

BUREAU OF RECLAMATION (BOR) - The Bureau of Reclamation's Environmental Applications and Research Group, along with its cooperators, is developing Integrated Pest Management (IPM) techniques for Reclamation facilities. Some of the topics currently being developed by the Aquatic Site Pest Management Team include biological control agents, improved pesticides and application techniques, studies on pest physiology, mollusk research, mapping, and re-vegetation studies.

BUREAU OF LAND MANAGEMENT (BLM) - The BLM implements multiple strategies in combating invasive species. These include BLM's Invasive Plant Management Plan and the National Invasive Species Management Plan. Where appropriate, the BLM uses biological, mechanical and chemical control methods. It is BLM policy to use chemical pesticides only after considering alternative methods. Volunteers and partners play a significant role in helping land managers remove invasive species from public lands. Management of animal species, including invasive animals, on BLM lands is completed in cooperation with partnering state and federal agencies. The BLM is actively involved in quagga mussel research and management at Lake Havasu.

U.S. ARMY CORPS OF ENGINEERS - Los Angeles Division, Arizona-Nevada Field Office (ACOE) - The ACOE is currently involved in more than 36 projects throughout the state, including Alamo Lake. In other states, the ACOE coordinates activities between federal, state, and local agencies and organizations working on AIS related projects.

Tribal

There are 19 federally recognized Tribes in Arizona that comprise 28% of the land in Arizona, with 6.6% of the state's population being Native American. Tribal lands with reservoirs, lakes, rivers and streams represent watersheds that commonly cross state and tribal boundaries. A coherent strategy for AIS depends on addressing all waters of the region. However, federal reserved lands are subject to federal, not state law. Tribes are also empowered to develop tribal laws under the Clean Water Act and other authorities. With the myriad of authorities and regulations that apply to waters of this region, it is of critical importance that there exists a well-coordinated strategy for AIS problems that commonly transcend jurisdictional boundaries.

- All personnel using these units shall be properly trained (Uniform Mandatory Protocols {UMPS) for Watercraft Inspection-Decontamination Training {WIT-WID} as set forth by the Department's AIS Program.
- C. Partner with land management agencies to ensure AIS watercraft "Clean, Drain, Dry" protocols are added to all fishing tournament and other special use permits.
 - All permittees should be required to inspect boats for currently listed AIS coming from another body of water within seven days of the event.
- D. Where eradication may be feasible as determined by the AIS Program, coordinate/assist with specific location-based reduction and eradication efforts at water delivery system connected lakes/ponds and water endpoints (e.g., golf course ponds, city lakes, Community Fishing Program waters).
 - Pursued through cooperative and inter-governmental agreements and mutual participation by involved stakeholders concerning manpower and funding capacities.





D. HIGG

MerCruiser

VERSA

POLICE OFFICER
PERSEVERANCE
The Greater the Obstacle, the
More Glory In Overcoming It.
231

QUAGGA MUSSELS

OBJECTIVE

3

PREVENTION

Prevent the introduction of any new AIS into Arizona.

There are many potential AIS of concern that may be on the way to Arizona if not addressed in the short term. All invasive species (terrestrial and aquatic) present an enormous challenge to our current resident and native species, resulting in additional competition, predation, displacement, and disease potential. Some AIS obstruct water flows that inherently impact municipal, industrial, and irrigation water supplies and eventually degrade ecosystems, reducing or threatening recreational fishing and boating opportunities. AIS can also cause wildlife and human health problems. These reasons are not all-inclusive, but alone they should give cause for serious concern and the need for aggressive pathway management.

As the leader in AIS management/control, the Department's AIS Program must continue to improve protocols for watercraft decontamination and AIS abatement methodologies to address pathway issues. These pathways include, but are not limited to watercraft movement, overland transport of water-based equipment, social demand for food fish and pets, water movement and retention (e.g., canals, dams), and many other human caused intentional and unintentional introductions. The Department will collectively address pathway prevention, watercraft decontamination protocols, develop AIS abatement partnerships, and significantly increase our outreach and pathway prevention capabilities within the state.

PREVENTION APPROACHES:

- A. Address AIS/watercraft pathway prevention through the further development of a statewide watercraft/equipment inspection program for trailered boats and water-based equipment traveling in Arizona.
 - Provide for AIS abatement/outreach training opportunities for the public and Department employee's on a regular basis.
 - Implement multi-faceted AIS outreach efforts to inform our boating and fishing public concerning Arizona AIS laws/rules and their responsibilities at high priority pathways.
- B. Ensure all inter- and intra-state aquaculture facilities are certified/inspected to be AIS free.
 - Annually certify all AGFD hatcheries through self-certification protocols established by the AIS Program and the Colorado River Fish and Wildlife Council (CRFWC).



- Through new stipulations to R12-4-411, AIS-free certification is required from all aquaculture facilities importing aquatic species (e.g., bait fish, sport fish, etc.) into Arizona waters.
- C. Require all marina-based, moored watercraft being transported in and into Arizona receive watercraft decontaminations prior to launching in all Arizona waters.
- Develop agreements between all states establishing and approving Uniform Minimum Protocols & Standards for Watercraft Inspection-Decontamination through the Western Regional Panel of the Aquatic Nuisance Species Task Force.
 - Require all marina-based, moored watercraft in currently listed AIS infested waters receive watercraft decontaminations from the marina or lake management authority prior to transport away from that water.
 - Require all other marina-based, moored watercraft being transported into Arizona receive watercraft decontamination prior to launching in Arizona waters. This can be done by another state or entity using Uniform Minimum Protocols and Standards (UMPS).
- D. Develop and implement a comprehensive early detection and rapid response protocol(s) to defend against pioneering AIS that may become established in the future.
- Work in coordination with the Department's Water Quality Program, the U.S. Bureau of Reclamation (currently contracted by SRP for invasive mussel monitoring), and local water/electric companies (e.g., SRP; CAP) concerning monitoring for ingress of Arizona listed and other potential aquatic invasive species into our state.
 - Lead, develop and implement a statewide early detection and rapid response plan by 2018.
 - To include comprehensive techniques, survey methodologies, manpower capacities, and funding mechanisms. This may involve outsourcing to a professional organization that uses proper, accredited lab sources.

Regional (federal and/or state collaborative entities)

WESTERN REGIONAL PANEL (WRP) – ANS Task Force {Primary Coordinating Entity in West} - The WRP was formed under a provision in NISA, 1996 and was formed to help limit the introduction, spread, and impacts of AIS into western North America. This panel includes representatives from federal, state and local agencies, including private, environmental, and commercial interests. The purposes of the WRP, as described in NISA, are to: make western recommendations to the ANS Task Force; coordinate activities in the West; and provide advice and expertise to the public and a forum for state/federal/private industry concerning AIS.

AQUATIC NUISANCE SPECIES TASK FORCE (ANS TASK FORCE) - The ANS Task Force is an intergovernmental organization dedicated to preventing and controlling aquatic invasive species through implementation of the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990 and the National Invasive Species Act (NISA) of 1996. The ANS Task Force consists of 13 federal agency representatives and 12 Ex-officio members and is co-chaired by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration. The ANS Task Force coordinates governmental efforts dealing with AIS in the U.S. with those of the private sector and other North American interests via regional panels and issue specific committees and work groups.

WESTERN INVASIVE SPECIES COORDINATING EFFORT (WISCE) – WISCE is an offshoot of the WRP and consists of the various state AIS Program coordinators. The group specifically addresses state/Regional AIS issues in the West and meets every other month. This group has a major influence on the current "Building Consensus" discussions/report and on yearly "Hill Visits" in Washington, D.C.

WESTERN ASSOCIATION OF FISH AND WILDLIFE AGENCIES (WAFWA) – WAFWA represents 23 states and Canadian provinces, spanning from Alaska to Texas and Saskatchewan to Hawaii. This group consists of Department Leadership Team and Executive Staff members and ties in with the AFWA Invasive Species Committee and WAFWA Invasive Species Working Group.

COLORADO RIVER FISH AND WILDLIFE COUNCIL (CRFWC) – The CRFWC is a state's fisheries & wildlife coordinating entity that usually meets in conjunction with WAFWA and consists of the Fisheries/Aquatic Wildlife Branch Chiefs from the state agencies that have management responsibilities for the Colorado River and its tributaries. This often involves invitations to federal authorities to further coordinate efforts concerning AIS in the West.

WESTERN GOVERNORS' ASSOCIATION (WGA) – The WGA represents the Governors of 19 Western states and three U.S.-flag islands. The association is an instrument of the Governors for bipartisan policy development, information exchange and collective action on issues of critical importance to the Western United States. It provides multistate leadership and helps Western Governors to: develop and promote sound public policy; exchange information and identify best practices; collect data and perform quality research, and; educate the public, opinion leaders and other policymakers

NATIONAL INVASIVE SPECIES AWARENESS WEEK (NISAW) – NISAW is a yearly event (usually in late February or early March) and consists of a broad coalition of agencies and organizations that coordinate a high-profile invasive species summit in Washington, DC to: call attention to invasive species issues – targeting Congress and federal agencies (Hill Visits and Congressional briefings); generate action – empowering new policies and provisions for adequate funding, and; build national grassroots networks to cooperatively limit the impacts of invasive species across North America.

OBJECTIVE 4 COMPLIANCE

Increase Department, partners, and public compliance with AIS laws, rules, and best management practices.

It is imperative that we intensify all information/education opportunities (Outreach) and their distribution concerning the increasing risk and impacts of AIS, particularly to anglers, watercraft users, and the state's water providers and electricity-producing infrastructure. Department surveys indicate that a significant portion of our constituents (e.g., boaters, anglers) have limited knowledge of the many issues that surround aquatic invasive species abatement and their own boat owner responsibilities. Yet that public knowledge and voluntary cooperation is the foundation of any AIS Program in North America.

Our continuing and coordinated outreach messaging must be robust and promote widespread awareness, understanding and support from the public and our partners. Future outreach messages should have a broad, consistent message for the general public to encourage behavioral change and build support for our combined actions to combat AIS. The AIS Program must also create more specific messages aimed at specific concerns to assist authorities responsible for acting on AIS, as well as water managers (who must make management decisions) and policymakers who control funding, legal authorities, and agency accountability, both on a state and federal level. Any AIS outreach project should anticipate pathways of possible future AIS introductions and convey information to key audiences who can take preventative action. Public involvement, especially through various outreach, angler surveys, and user-group forums, can also assist the Department and our partners in determining future resource allocation.

COMPLIANCE APPROACHES:

- A. Increase AIS compliance to over 90% for all watercraft owners in Arizona through increased enforcement efforts and awareness of existing laws and protocols that aim to control the transport or movement of AIS in and through Arizona.
 - Coordinate and develop comprehensive guidance documents for law enforcement efforts for AIS laws/rules (per Article 11 - R12-4-1102) concerning AIS affected waters and Arizona's borders.
 - Conduct a minimum of 1,000 hours of enforcement patrols around AIS affected waters annually.
 - Conduct and coordinate focused patrols around AIS rules/laws (e.g. pull the plug rules, transport of AIS from affected waters law, etc.) using Department and local jurisdiction officers.
 - Use existing LE resources efficiently by focusing LE efforts and covert operations around AIS affected waters that are believed to have problems with angler/boater compliance.

- Decrease response time for AIS Program enforcement needs to address in-transport movement of AIS.
 - Seek additional LE resources/opportunities to provide effective and efficient prevention and control of potential AIS introductions, such as trained K-9 units.
 - Seek additional enforcement opportunities (state and federal) to provide more comprehensive and user-friendly processes to prevent/control AIS introduction and spread.
 - Seek to reprioritize the enforcing of AIS rules and laws, both federal and state, and increase engagement with the Arizona court system (e.g., judges, AG's office), emphasizing the cost of non-compliance.
- B. Implement a “boots-on-the-ground” initiative. Fully integrate Department Regional Fish Programs into AIS abatement activities.
- Regionalize field personnel (FTEs with a nexus to the AIS Program) for implementing priority AIS outreach/compliance surveys and public watercraft/equipment inspections and decontaminations.
 - Continue to ensure regional programmatic HACCP protocols are up to date and best management practices are being implemented.
 - Purchase and deploy regional AIS decontamination equipment.
 - Contract with outside employment agencies to provide contracted staff to implement AIS containment/prevention/monitoring services.
- C. Sponsor and implement effective and efficient AIS training to internal Department staff and partners as appropriate.
- Annually train Department and enforcement personnel on AIS identification, state regulations, and watercraft inspection methodologies with classes such as WIT/WID (Watercraft Inspection & Decontamination Training), HACCP (Hazard Analysis Critical Control Point – Best Management applications); new employee orientation, and; specific law enforcement training concerning AIS abatement.

State of Arizona

State and local stakeholder agencies can play the major role in controlling the spread of non-native invasive species. States have authority to decide which species can be imported and/or released. However, the U.S. Constitution vests the power to regulate international and interstate commerce to Congress. Federal law may preempt state law, but states retain almost unlimited power to define which species are imported and/or released. Although many state agencies have some authority to regulate AIS, the Arizona Game and Fish Department has the centralized authority and management structure to coordinate AIS prevention and control activities in Arizona. Here is a brief list of state agencies and other stakeholder organizations that have a vested interest in AIS management in this state:

ARIZONA INVASIVE SPECIES ADVISORY COUNCIL (AISAC) – AISAC was created by executive order 2005-09. It was established under the joint leadership of the Department and the ADAG to develop a consensus vision for a coordinated, multi-stakeholder approach to all invasive species management in Arizona. This Governor appointed advisory council developed recommendations on how to coordinate private local, tribal, state, and federal entities on invasive species management efforts and issues in Arizona.

ARIZONA DEPARTMENT OF AGRICULTURE (ADAG) – ADAG is mandated in the protection of state, private, and public lands from a number of terrestrial and aquatic noxious weeds. A.A.C. R3-4-244 lists regulated and restricted noxious weeds and A.A.C. R3-4-245 lists prohibited noxious weeds that may not be transported. Both of these laws include several threatening AIS. A.R.S. §2015.01 allows the ADAG to establish or approve programs to treat, spray, control, suppress or eradicate noxious weeds.

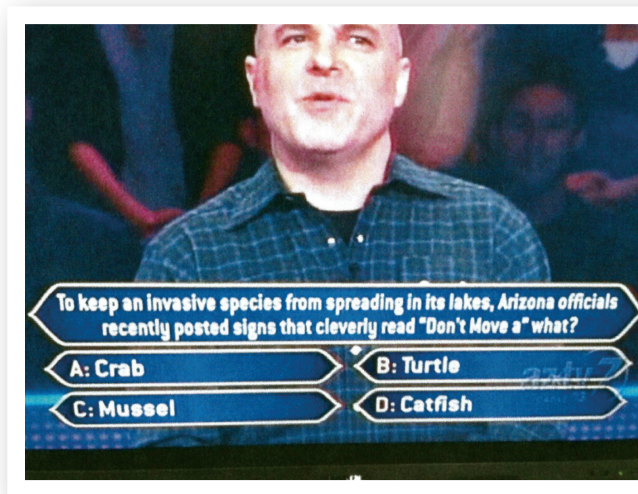
ARIZONA STATE PARKS (ASP) – A.R.S. §41-511 established the state Parks Board to seek, acquire, preserve and maintain areas of natural features, scenic beauty, historical interest and zoo/botanical gardens for the education, pleasure, recreation, and health of the people. This statute also provides for the state Parks Board to enter into agreements with the other state governmental units for the development and protection of state parks, monuments, and trails.

SALT RIVER PROJECT (SRP) – SRP delivers over 800,000 acre-feet of water annually to a 375-square-mile service area and manage a 13,000-square-mile watershed that includes an extensive system of reservoirs, wells, canals and irrigation laterals, thus making them a major stakeholder in AIS prevention and management.

CENTRAL ARIZONA PROJECT (CAP) – The CAP aqueduct system delivers an average of 1.5 million acre-feet of water per year to central and southern Arizona, including the Phoenix and Tucson metropolitan areas. The canal system stretches 336 miles across the state, lifts the water more than 2,900 vertical feet, and incorporates control structures and pumping plants to regulate the flow of water. The CAP system includes 14 pumping plants, one hydroelectric pump/generating plant at New Waddell Dam, 39 radial gate structures to control the flow of water, more than 50 turnouts used to deliver water to municipal water treatment plants and other customer distribution systems, and the Lake Pleasant storage reservoir. The entire CAP system is operated from a control-center at the CAP headquarters in north Phoenix, thus making them another major stakeholder in AIS prevention and management.

CENTRAL ARIZONA WATER CONSERVATION DISTRICT (CAWCD) – In 1971, the Central Arizona Water Conservation District (CAWCD) was created to provide a means for Arizona to repay the federal government for the reimbursable costs of construction. It now manages and operates CAP.

- D. Lead Department response (e.g., Bluesheets, NEPA reviews, etc.) as it pertains to statewide and western region AIS abatement requests, document reviews, and data analyses.
- E. Rebrand and retool the information and education components of the AIS program to increase compliance. The intent is to provide the public outreach on how their meaningful actions can prevent the spread and reduce the many impacts of AIS to their favorite waters and how AIS dramatically impacts their future recreational opportunities.
- Using an independent marketing firm, implement a focus group study to evaluate the current messages being delivered.
 - Using an independent marketing firm and internal resources, increase passive outreach opportunities through the use of informational signage, popular media, kiosks, brochures, and other outreach materials.
 - Manage, share, and continually update the AIS-quagga webpage on the Department's website/portal.
 - Incorporate Arizona's AIS Program information into boat operator/watercraft safety and aquatic education classes and handouts.
 - Inform and educate policymakers (local, state, national level) on the current status and impacts of AIS and potential mitigation needs to lessen or avoid those impacts.
 - Annually coordinate and implement an AIS (quagga) messaging outreach plan using popular (billboards, radio and TV ads, etc.) and social media plans and Department designed signs, brochures, leaflets, rack cards, etc. for statewide distribution.
 - Seek additional marketing strategies to enhance future AIS messaging as the AIS Program evolves (e.g., Twitter, new mass media outlets).
 - Distribute AIS/quagga informational materials at all AGFD offices and various museums, conferences, shows, boating/fishing events, public gatherings, sporting good vendors, watercraft/marine shops, boat marina's, watercraft transport companies, etc.
 - Continually work with the Department's Information Branch to produce popular articles, press releases, commercials, social media opportunities, and public service announcements concerning AIS management and control.
 - Expand statewide participation and partnerships by networking with national and regional public education campaigns (Stop Aquatic Hitchhikers™, Protect your Waters, Habitattitude™) to increase awareness of the AIS issue with consistent messaging.
 - Continue to foster relationships with sporting/angling/boating groups and manufacturers and other conservation organizations to foster outreach and educational activities relating to the AIS Program.
 - Coordinate with K-12 Schools for educational and outreach opportunities.
 - Facilitate and coordinate the collection and dispersal of information, research, and data on AIS in western North America, specifically Arizona.



Who Wants To Be A Millionaire, May 7, 2013 on ABC TV. Photo by Kami Silverwood

A large billboard advertisement with a yellow and red background. On the left, there is a large, dark, textured mass resembling a cluster of mussels or algae, with a silver drain plug visible in the center. The text "DON'T MOVE" is in large, bold, black letters at the top. Below it, in a red banner, is the text "Pull Your Boat's Drain Plug ... EVERY TIME". At the bottom, in large, bold, black letters, is "A MUSSEL". Below this, in a white banner, is the text "CLEAN • DRAIN • DRY | AZGFD.GOV/AIS". On the far right of the billboard is a circular logo for "ARIZONA GAME & FISH". The billboard is mounted on a metal structure with the word "LAMAR" visible on the side.

DON'T MOVE

Pull Your Boat's Drain Plug ... EVERY TIME

A MUSSEL

CLEAN • DRAIN • DRY | AZGFD.GOV/AIS

ARIZONA GAME & FISH

LAMAR

OBJECTIVE

5

RESEARCH & DATA

Measure the success of the AIS program and this Vision.

Data collection and subsequent research activities concerning aquatic invasives should be pursued and financially supported to gain further knowledge on future management schemes and possible eradications. iMapInvasives (the Department's invasive species database) must be continued and supported as the user-friendly database for invasive species in Arizona. Once any invasive species has been introduced and infests any Arizona waters, controlling it can require significant time and sustained expenditures. Prevention (refer back to Objectives 2 and 3) is the first line of defense and the most cost-effective measure to protect against AIS introduction.

COLLECT, MAINTAIN AND DATA ANALYSIS APPROACHES:

- A. Continue support for iMapInvasives as the dedicated database for documenting distribution and abundance of all AIS in Arizona.
 - Promote the usage of iMapInvasives internally, with our local and regional partners.
 - Continue using as the main source for public support, input, and scientific information about Arizona AIS.
- B. Initiate and manage outreach surveys to determine AIS Program compliance.
- C. Investigate research opportunities on AIS impacts concerning the local environment, economy, and any human health issues.
 - Promote and facilitate statewide AIS research opportunities with local colleges and universities.
 - Coordinate with the Department's Research Branch to pursue funding for AIS abatement research opportunities.
 - Evaluate environmental conditions on non-AIS waters to determine potential feasibility/efficacy of future invasions and why an invasion may not occur.
- D. Investigate/research alternative management techniques for their effect on established AIS in Arizona and western North America.
- E. Pursue the technology for electronic databases and scanning equipment (e.g., info gathering/ tracking of watercraft that are exiting AIS listed waters) and increase the coordination of those data with other state/federal entities concerned with AIS abatement protocols in western North America (e.g., current state of Colorado watercraft/AIS program database).
- F. Coordinate messaging opportunities for AIS prevention/control with Arizona water-user companies and organizations to increase outreach opportunities and monitoring/research efforts.



QUAGGA MUSSELS

OBJECTIVE

6

BUSINESS MODEL

Develop a strong business approach to AIS management ensuring long term financial viability to implement the objectives in this Vision.

Funding has been and will continue to be an integral component of a comprehensive, coordinated plan to address AIS issues in Arizona and the West. Investment in current AIS Program development will reduce future costs for control and abatement, as well as other costs that all sectors of Arizona's economy, especially recreation and water/electric production, may have to bear. Stable funding sources are required to implement a consistent, long term approach for prevention, management, control and to sustain the necessary infrastructure to support AIS Program activities. Funding must be recurring, flexible, and accountable and we must acknowledge that we are all in this for the long haul and addressing the many facets of AIS abatement must continue in perpetuity.

Many prevention, control, and management actions can continue to be addressed with Arizona's existing infrastructure, resources, knowledge and expertise. The key is to continually improve communication, coordination, collaboration and resource sharing among the many stakeholders affected by AIS. Water-user groups and other stakeholders continued interest, understanding and support are essential to pulling together resources and addressing this challenge meaningfully and successfully. Invasive species do not care about legal boundaries or waterway authorities. Local, state, and federal entities must coordinate their resource efforts collaboratively to combat this increasingly difficult and expanding issue. Memorandum of understandings (MOU), cooperative agreements, and individual AIS lake management plans can be primary mechanisms to promote future communication, cooperation, and resource sharing capabilities between the Department (as the lead AIS management entity) and other state, federal, tribal, private and non-governmental agencies and organizations throughout Arizona and the West.

The AIS Program is housed in the Department's Aquatic Wildlife Branch and is currently funded from Arizona's watercraft licensing fund (A.R.S. §5-323 1.a) and Arizona's Heritage Fund. The program also pursues and administers various federal grant opportunities from the U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Land Management (USBLM), and U.S. Bureau of Reclamation (USBR) to fund the AIS Program's many functions for the public good.

BUSINESS APPROACHES:

- A. Annually update the Department's Executive Staff about AIS programmatic functions, personnel needs, and funding requirements, through budget appropriation requests.
- B. Ongoing and continual pursuit of federal grants (through eCivis; grants.gov) specifically for AIS abatement.
- C. Continually and consistently pursue operational and business plan funding support from federal entities and partners in AIS management to increase programmatic and "boots-on-the-ground" needs.
 - Currently, the Department receives federal grant monies (match fund opportunities) through; U.S. Fish and Wildlife Service (NISA-ANS Task Force; Quagga-Zebra Action Plan); U.S. Bureau of Land Management (AIS Program-Havasupai Field Office); U.S. Bureau of Reclamation (AIS abatement on the lower Colorado River).

- Other potential granting opportunities may evolve from the U.S.D.A. Forest Service, U.S. Army Corps of Engineers, Maricopa County Parks, Arizona state Parks, and SRP/CAP.
 - Future planning should include AIS Program staff and possible private contractors at all AIS affected waters (based in regional offices, where appropriate) for localized coordination of watercraft/equipment inspections, decontaminations, and outreach activities as outlined throughout.
- D. Annually pursue increases in AIS Program appropriated monies from the Watercraft Licensing Fund {per A.R.S. §5-323 1(a)} to reach a goal of \$500,000 per year as a base.
- Total Program Funding (including federal AIS grants) to be used for all program components (reference attached Implementation Table) such as:
 - AIS Program Personnel - 3 FTEs for the statewide program (AIS Program statewide Coordinator; 2 AIS Program Specialists); 4-6 part-time/full-time Regional AIS Technician positions, and summer Interns for support at key waters/areas (e.g., Regions IV {Havasu}, VI {Pleasant}, II {Powell}, and III {Mojave/Mead}).
 - Various programmatic equipment needs (e.g. trucks, Decon Facility/station, communication/computers, etc.).
 - Programmatic staffing needs (PS/ERE; travel; law enforcement) in support of other regional personnel needs for LE and watercraft inspections and decontaminations.
- E. Aggressively pursue AIS prevention/control/management plans (MOU; IGA) with other state and federal partners for AIS/quagga infested waters that are managed by these entities.
- In the short term, AIS prevention and management plans for individual waters and land management agencies should be vigorously pursued with local partner agencies, such as the USFS-Tonto and Maricopa County Parks (Lk Pleasant), which are currently infested with quagga mussels.





QUAGGA MUSSELS

IMPLEMENTATION TABLE														
State of Arizona Aquatic Invasive Species Program Vision 2016-2025														
Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates (NPF = nominal or normal program funding)									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
1		Position the Department in the Lead Role for all AIS Prevention and Management Activities in Arizona												
	A	Re-establish the Arizona (Aquatic) Invasive Species Advisory Council through Governor's Office Executive Order.	AGFD State Local Federal	30K	2.5K	2.5K	5K	5K	2.5K	2.5K	2.5K	2.5K	2.5K	2.5K
	B	Participate, support, and pursue leadership roles in regional, federal, and international efforts concerning AIS management and control.	AGFD	NPF										
	C	Coordinate local area meetings with federal, state, and local stakeholders that focus on constructive discussion of issues and cooperative development of AIS implementation projects to address local AIS abatement issues.	AGFD State Local Federal	75K	7.5K	7.5K	7.5K	7.5K	7.5K	7.5K	7.5K	7.5K	7.5K	7.5K
	D	Actively pursue coordination and support from local agencies that have LE responsibilities at AIS affected waters pertaining to Arizona AIS laws and rules.	AGFD State Local Federal	60K	5K	5K	10K	5K	5K	10K	5K	5K	5K	5K
	E	Plan and provide for a semi-annual AIS Summit in Arizona to update current status and potential prevention/management alternatives for our partners, to include state/federal/local entities and the various water-user groups and industry affected by AIS. This should include bordering state's representation as AIS abatement is a multi-jurisdictional issue.	AGFD State Local Federal Other states	24K	--	--	6K	--	6K	--	6K	--	6K	--

IMPLEMENTATION TABLE

State of Arizona Aquatic Invasive Species Program Vision 2016-2025

Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates {NPF = nominal or normal program funding}									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
2		Contain the Spread and Eliminate, where possible, Listed AIS Already Affecting Arizona Waters												
	A	Pursue Director's Order changes; Rule change – Article 11 – R12-4-1102. Implement rule changes to AIS Director's Orders to require all boats statewide to clean, drain, and dry their watercraft and equipment before transport from all waters.	AGFD	NPF										
	B	Develop and implement cooperative partnership agreements with land management agencies requiring Marina operators, through the permitting process, to implement current AIS Director's Orders.	AGFD State Local Federal	39K	3K	6K	6K	6K	3K	3K	3K	3K	3K	3K
	C	Partner with land management agencies to ensure AIS watercraft “Clean, Drain, Dry” protocols are added to all fishing tournament and other special use permits.	AGFD State Local Federal	NPF										
	D	Where eradication may be feasible as determined by the AIS Program, coordinate/assist with specific location-based reduction and eradication efforts at water delivery system connected lakes/ponds and water endpoints (e.g., golf course ponds, city lakes, Community Fishing Program waters).		110K	--	5K	15K	15K	15K	10K	15K	10K	15K	10K

IMPLEMENTATION TABLE

State of Arizona Aquatic Invasive Species Program Vision 2016-2025

Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates (NPF = nominal or normal program funding)									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
3		Prevent the Introduction of any New AIS into Arizona												
	A	Address AIS/watercraft pathway prevention through the further development of a statewide watercraft/equipment inspection program for trailered boats and water-based equipment traveling in Arizona.	AGFD	900K	10K	75K	115K	100K	100K	100K	100K	100K	100K	100K
	B	Ensure all inter- and intra-state aquaculture facilities are certified/inspected to be AIS free.	AGFD USFWS	90K	2K	7.5K	10K	10K	10K	10K	10K	10K	10K	10K
	C	Require all marina-based, moored watercraft being transported in and into Arizona receive watercraft decontaminations prior to launching in all Arizona waters.	AGFD State Local Federal	700K	130K	60K	80K	70K	70K	60K	60K	60K	60K	60K
	D	Develop and implement a comprehensive early detection and rapid response protocol(s) to defend against pioneering AIS that may become established in the future.	AGFD	275K	--	25K	75K	50K	25K	25K	25K	25K	25K	25K

IMPLEMENTATION TABLE

State of Arizona Aquatic Invasive Species Program Vision 2016-2025

Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates <small>(NPF = nominal or normal program funding)</small>									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
4		Increase Department, Partners, and Public Compliance with AIS Laws, Rules, and Best Management Practices												
	A	Increase AIS compliance to over 90% for all watercraft owners in Arizona through increased enforcement efforts and awareness of existing laws and protocols that aim to control the transport or movement of AIS in and through Arizona.	AGFD	1.38 mil	30K	80K	250K	250K	170K	100K	150K	100K	150K	100K
	B	Implement a “boots-on-the-ground” initiative. Fully integrate Department Regional Fish Programs into AIS abatement statewide activities.	AGFD	678K	3K	100K	100K	75K	75K	75K	75K	75K	75K	75K
	C	Sponsor and implement effective and efficient AIS training to internal Department staff and partners as appropriate.	AGFD State Local Federal	68K	3K	10K	10K	10K	10K	5K	5K	5K	5K	5K
	D	Lead Department response (e.g., Blue-sheets, NEPA reviews, etc.) as it pertains to statewide and western region AIS abatement requests, document reviews, and data analyses.	AGFD	NPF										
	E	Rebrand and retool the information and education components of the AIS program. The intent is to provide the public outreach on how their meaningful actions can prevent the spread and reduce the many impacts of AIS to their favorite waters and how AIS dramatically impacts their future recreational opportunities.	AGFD	3.13 mil	280K	220K	400K	330K	300K	400K	300K	300K	300K	300K

IMPLEMENTATION TABLE

State of Arizona Aquatic Invasive Species Program Vision 2016-2025

Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates {NPF = nominal or normal program funding}									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
5		Measure the Success of the AIS Program and this Vision												
	A	Continue support for iMapInvasives as the dedicated database for documenting distribution and abundance of all AIS in Arizona.	AGFD	50K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)	5K (+GIS FTE)
	B	Initiate and manage outreach surveys to passively determine AIS Program compliance.	AGFD	550K	50K	75K	50K	50K	50K	75K	50K	50K	50K	50K
	C	Investigate research opportunities on AIS impacts concerning the local environment, economy and any human health issues.	AGFD Univ	750K	--	130K	200K	100K	100K	70K	50K	50K	50K	--
	D	Investigate alternative management techniques for their effect on established AIS in Arizona and the desert southwest.	AGFD Univ	450K	--	50K	50K	50K	50K	50K	50K	50K	50K	50K
	E	Pursue the technology for electronic databases and scanning equipment (e.g., info gathering/ tracking of watercraft that are exiting AIS listed waters) and increase the coordination of that data with other state/federal entities concerned with AIS abatement protocols in western North America.	AGFD State Local Federal Other states	300K	3K	30K	50K	37K	30K	30K	30K	30K	30K	30K
	F	Coordinate messaging opportunities for AIS prevention/control with Arizona water-user companies and organizations to increase outreach opportunities and monitoring/ research efforts.	CAP	57K	2K	10K	5K	5K	5K	10K	5K	5K	5K	5K

IMPLEMENTATION TABLE

State of Arizona Aquatic Invasive Species Program Vision 2016-2025

Objective	Strategy	Strategic Approaches	Participating Agencies	Total Cost (\$000)	Cost Estimates {NPF = nominal or normal program funding}									
					FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
6		Develop a Strong Business Approach to AIS Management Ensuring Long-Term Financial viability to Implement the Objectives and this Vision												
	A	Annually update the Department's Executive Staff about AIS programmatic functions, personnel needs, and funding requirements, through budget appropriation requests.	AGFD\I	NPF										
	B	Ongoing and continual pursuit of federal grants (through eCivis; grants.gov) specifically for AIS abatement.	AGFD Federal	NPF										
	C	Continually and consistently pursue operational and business plan funding support from federal entities and partners in AIS management to increase programmatic and "Boots-on-the-Ground" needs.	AGFD Federal State	60K	5K	10K	5K	5K	5K	10K	5K	5K	5K	5K
	D	Annually pursue increases in AIS Program appropriated monies from the Watercraft Licensing Fund to reach a goal of \$500,000 per year as a base.	AGFD AGFC	NPF										
	E	Aggressively pursue AIS prevention/control/ management plans (MOU; IGA) with other state and federal partners for AIS/quagga infested waters that are managed by these entities.	AGFD State Local Federal	80K	5K	7.5K	15K	7.5K	5K	15K	5K	5K	5K	5K

AIS Program Expenditure Needs per FY

FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
\$546 K	\$853 K	\$1.456 MIL	\$1.220 MIL	\$1.049 MIL	\$1.073 MIL	\$964 K	\$903 K	\$964 K	\$853 K

Aquatic Invasive Species (AIS) are threatening the public's angling and boating recreation opportunities and impacting our state's water and electrical infrastructure. The spread of quagga mussels and other aquatic invasive species has tremendous financial, ecological, and human health and safety impacts. The highly invasive quagga mussels are very prolific reproducers that can clog water intake structures, greatly increasing maintenance costs for dams, water treatment facilities, irrigation systems, and power plants. Arizona residents depend upon safe and reliable electrical and water supplies from Salt River Project (SRP) and the Central Arizona Project (CAP) canals. The delivery of over 800 billion gallons of water and the ever-increasing electricity needs of over 2.5 million Arizona residents is put at risk by the presence and future advancement of quagga mussels in these canals and delivery infrastructure.

Recreational activities and family outings on lakes and rivers are adversely affected as invasive mussels aggregate and heavily encrust docks, buoys, boat hulls, engines, and anchors, and provide the potential for human injury through their sharp shells along our waterways. In Arizona, recreational boating has a total annual economic benefit of \$1.3 billion to the state, with a total number of recreational boats in excess of 125,000. The 360,000 anglers in Arizona account for 5.9 million days of fishing and over 1.57 billion dollars of economic impact.

If left unmanaged, AIS have the potential to severely impact the expenditures and numbers of recreational boaters and anglers in Arizona as well as increase the cost of water delivery to residents and businesses throughout the state.

Proposed Solution to the Problem or Issue:

Ensuring water and power delivery – Quagga mussels have become widespread within the Colorado River reservoir system, including the CAP canal. Quagga mussels have been found in the Salt River system managed by SRP. Given the rate of boating transfer between systems, it is surprising there has not been a confirmed case in the Verde River system to date. This has great importance to the water system that supplies the majority of water for municipal and industrial purposes in central Arizona. If there are biological, chemical or unidentified factors that preclude the presence of this species, the results of researching those factors might identify applicable mechanisms to control quagga mussels where they currently exist.

Increase economic development, recreational satisfaction and quality of life – The Department must strive to provide the boating public access to and expertise for mobile watercraft decontamination units (MDU) to clean, flush, and decontaminate their watercraft of all species of AIS. The Department plans to work with local infested-lake marinas in providing them MDUs for their usage with the boating public. It is noted that the highest threat potential for movement of AIS (especially live and viable AIS) is marina-based and/or long-term moored watercraft. Strategic placement of these watercraft decontamination units at marinas at highly infested waters at marinas will provide ample opportunities for the boating public to participate. However, this will take money and time to initiate.

Rebranding of AIS Program – The “Don’t Move a Mussel – Pull your Boat’s Drain Plug” quagga outreach campaign has been in effect for over seven years. The effectiveness of the messaging is relatively untested in its ability to shape boater behavior as it relates to stopping

the spread of aquatic invasive species. The AIS program has proposed to retain the services of an external, professional marketing firm to evaluate the Department program, make recommendations on rebranding, and to help develop and implement new messages for the boating public. This will direct future efforts to improve compliance, but more importantly, will help limit the spread of AIS that could have extreme economic impact to water delivery/data collection and power production.

Measuring Success – Develop a well-designed mail questionnaire that will solicit information to effectively gauge people’s understanding of the importance of limiting the spread of not only quagga mussels, but other invasive species as well. Further, a component of the survey device will focus on compliance rate with existing laws. In addition to the questionnaire, other techniques to measure compliance will be evaluated. In the cumulative, these data will be used to assess changes in approaches to AIS management in the Southwest.

AIS Law Enforcement Efforts – The Department’s law enforcement officers patrol the state’s lakes and rivers enforcing laws, protecting public safety, investigating watercraft accidents, stopping the spread of aquatic invasive species, and enforcing fishing regulations. The Department provides 25% of all boating law enforcement statewide and is responsible for watercraft accident reporting in the state of Arizona.

A base appropriation increase from the Watercraft Fund is needed to provide an additional 1,500 hours of patrol time enforcing state laws, protecting public safety, responding to and investigating watercraft crashes, and stopping the spread of aquatic invasive species.

Aquatic Invasive Species (AIS) have severely impacted Arizona waterways and water infrastructures. Laws have been in place

for several years which restrict the movement of watercraft from infested bodies of water to non-infested waters without specific decontamination protocols. The education and outreach component of this change has been relatively effective in altering public behavior, but special enforcement projects are required to further limit the uncontrolled spread of this invasive species.



DIDYMO (ROCK SNOT)



RUSTY CRAYFISH



Arizona Game & Fish Department
5000 W. Carefree Highway
Phoenix, AZ 85086
(602) 942-3000 | www.azgfd.gov

The Arizona Game and Fish Department prohibits discrimination on the basis of race, color, sex, national origin, age, or disability in its programs and activities. If anyone believes that they have been discriminated against in any of the AGFD's programs or activities, including employment practices, they may file a complaint with the Director's Office, 5000 W. Carefree Highway, Phoenix, AZ 85086, (602) 942-3000, or with the U.S. Fish and Wildlife Service, 4040 N. Fairfax Dr. Ste. 130, Arlington, VA 22203. Persons with a disability may request a reasonable accommodation or this document in an alternative format by contacting the Director's Office as listed above.